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L25: Entry 7 of 10

File: USPT

Feb 11, 1997

DOCUMENT-IDENTIFIER: US 5603021 A

TITLE: Methods for composing formulas in an electronic spreadsheet system

Brief Summary Text (22):

The Formula Outline Pane provides an outline view of the current formula. The outline view includes folder icons to the left of the outline for indicating whether a particular subexpression has been expanded or collapsed. The user can easily expand or collapse portions of a formula by simply clicking on the corresponding folder icon. A Cell Value Field, which is provided in conjunction with the Formula Outline Pane, displays the current results for the formula. If a formula has not been correctly completed by the user (e.g., the user is still editing the formula), the Cell Value Edit Field displays "ERR." In conjunction with this, the outline displays a red question mark icon for indicating that portion of the formula (i.e., subexpression) which is currently incomplete.

Detailed Description Text (61):

The Formula Composer Dialog 301 provides specific areas corresponding to the above-mentioned "views": Formula Outline Pane 307, Subexpression Edit Field 305, and Formula Pane 302. The user employs these views for creating and revising formulas. In the Formula Outline Pane 307, the user can instruct the system to select part of a formula, expand or collapse a formula outline, or go to cells referenced by the formula. The Pane 307 can be used to quickly add new @-functions to the formula. Since Dialog 301 of FIG. 3A was invoked without an existing formula, Formula Outline Pane 307 displays a Placeholder 308 (red question mark icon) and Help text 309. Similarly, since no function is active, the Formula Pane defaults to displaying a Formula Calculator 302, which the user may use to perform calculations within the formula.

Detailed Description Text (68):

FIG. 3E presents a more detailed view of the Formula Composer Dialog 301a which was shown in FIG. 3D. As shown, Formula Outline Pane 368 provides an outline view of @AMAIN(), the current formula. The outline includes folder icons to the left of the outline for indicating whether a particular subexpression has been expanded or collapsed. For instance, the user can expand or collapse portions of a formula by clicking on the folder icon 353. The outline can include several levels, with each level containing a different subexpression. By default, the Formula Outline Pane shows one expanded level of the outline. Cell Value Field 351 displays the current result for the formula. Since the formula has not been correctly completed by the user at this point in the example (i.e., the user has not supplied values for the arguments to the formula), Cell Value Field 351 displays ERR. Similarly, the red question mark icon 354 is appended to the outline, for indicating that the formula is currently incomplete.

Detailed Description Text (91):

FIG. 5 presents a conceptual view of the architecture underlying the Formula Composer. The Composer's architecture is divided along the three main areas of the user interface: Formula Outline Pane, Subexpression Edit Field, and Function Pane Input Field(s). As previously demonstrated by above examples, these modules maintain communication links, so that all the components of the Formula Composer remain synchronized at all times.

Detailed Description Text (92):

Changes propagate as follows. A change to the formula in the Outline Pane causes the system to update the Subexpression Field and Function Pane. The communication links which accomplish this are represented by path #2 and path #4. In a similar manner, a change to the Subexpression Field causes the system to update the Outline Pane (via path #1) and the Function Pane (via path #6). Finally, a change in the Function Pane, namely user-supplied information entered into input fields, causes the system to update the Outline Pane (via path #3) and the Subexpression Field (via path #5). The discussion which follows will focus on servicing of the various communication paths which tie together the modules which comprise the Formula Composer.

Detailed Description Text (123):

".backslash.1" is an escape sequence character serving as a place holder for the first input field. Similarly, ".backslash.2" and ".backslash.3" are second and third input place holders, respectively. For mode 1, therefore, placement of argument information in the function is achieved by simple substitution of an escape sequence character with its corresponding input expression.

Current US Class (1):707

## CLAIMS:

2. The method of claim 1, wherein step (e) comprises:

for each of said at least one formula node, displaying its subexpression as a node on a hierarchical outline.

9. The method of claim 1, wherein step (c) includes:

displaying as a node of the outline view each subexpression of said at least one formula node; and

displaying a folder icon next to some of the nodes of the outline for indicating to the user that the nodes can be expanded and collapsed.

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